USACF NEWSLETTER

September 1992

USACF NEWSLETTER
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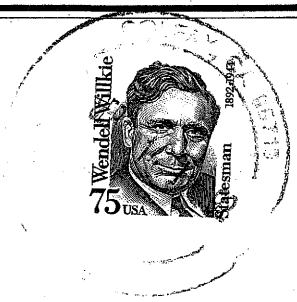
COLFAX, CA 95713



Adressee

Charles Moon
155 Myrtle Ct.
Arcata, CA 95521

Vol. 2 No. 3

YOUR OFFICERS FOR 1992-1994

- President: Norman Steele
  607 N. 62nd St., Seattle, WA 98103
  206--782-5770
- Vice President: Hubert Racketts
  PO Box 4623, Pagosa Springs, CO 81157
  303--731-5924
- Secretary: Walter Carss
  Rt. 3, Box 700, Brenham, TX 77833
  409--836-6910
- Treasurer: Lillian Hettich
  31 Sea Breeze Drive
  Half Moon Bay, CA. 94019
  415--726-1680
- Sponsor Chairman: Charles Hettich
  31 Sea Breeze Drive
  Half Moon Bay, CA. 94019
  415--726-1680
- Membership Chairman: Marian Alden
  22372 Ralston Ct., Hayward, CA 94541
  510--537-9281
- Rules and Competition Chairman: Bill Norton
  276 Belblossom Way, Los Gatos, CA 95030
  408--356-8254
- Editor: Fred Van Sant
  25267 Pineview Dr., Colfax, CA 95713
  916--346-2042

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Please note the new full-page Membership Application Sheet at the end. Make a copy of this sheet and give to any prospective new member.

The USACF Newsletter is a quarterly publication of the USA Competition Faceters.

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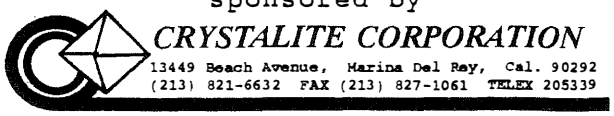


CHANGES

Charles and Lillian Hettich have moved to Half Moon Bay, CA., see Officer list for new address.

Walter Carss is taking over the Cup Chairman job for the 1994 Cup Challenge. Walt needs to devote his attention to his new job, and requests that we find a new Secretary, preferably someone on the West Coast who can attend the meetings. Walt finds it a bit difficult to hop around on old woody. Please help your fellow faceters out by volunteering for Secretary. Not too much work is involved

---

New Members

S.A.Wright
2235 N. Stockton St. Stockton, CA
209--463-5979

Dr. Marvin Schles
167 Knollwood Dr., Charleston, WV 25302
304--342-6368

John McClure
75 Castlewood Dr., Pleasanton, CA 94566
510--846-5793

Welcome to you all.

IT'S NOT TOO LATE

to cut for the International Faceters Fair Competitions Nov. 7th. For information write Jean Maudsley, 1909 Lambeth Way, Sacramento, CA 95608.

Ultratec: Case of stones
Intermediate: Sunlight Cut, Quartz.
D.P.S. Gems' Masters: Nulli Secundus, Quartz.
B & B's Intnl. Open: London Shield II, Amethyst.
PRO-AM: 3 stones, fixed size & material.

1. Rings of Fire, 17 mm, Spinel
2. Tourmaline Triangle, 12 mm, Quartz.
3. FVS-140, 10-12.9 mm, YAG.

Russ's Gems Open: Any Cut, Topaz, 10-12 mm

Three Things That WIII Never Change

1) Death. 2) Taxation. 3) The Standard Round Brilliant in Quartz for Novice Competitions.

The Secretary reports:

USACF MEETING AT HAYWARD

President Norman W. Steele, Jr., convened a meeting of the USACF at the Centennial Exposition Hall in Hayward, California at 4:00 PM on Saturday, August 22, 1992. Also in attendance were other interested faceters present at the California Federation of Mineral Societies show, including Ed Romack, President of the AFMS, and Clare Gagnon, President of the Southern California Faceters Guild. The purpose of the meeting was to make certain decisions concerning participation in the 1994 Australian vs USA Faceting Challenge, in response to communications from Rupert Pickrell, the Australian Chairman/Coordinator. As stated by the President, the decisions to be made were: (1) Would the USACF participate in the proposed Challenge, (2) would the USACF accept the Australian invitation to send Judges and/or Observers to participate in the evaluation of the entries, and (3) would the USACF avail itself of the offer to choose two of the four designs to be used in the Challenge?

After a review by the President of the applicable correspondence to date, those attending unanimously agreed that we would support the forthcoming 1994 Challenge. With regard to the second item for consideration, it was agreed that we would, in some manner, participate in the judging of the entries as requested by the Australian Committee. Inasmuch as all five American judges qualified under the Australian Rules had indicated an interest in cutting for the 1994 Challenge, it was the consensus that our participation would probably consist of providing one or more observers (pencilers, in the Australian terminology). In any event, it was decided that the extent and nature of our participation in the judging would be decided at a later date, when the availability of one or more American judges could be determined.

After reaching a consensus that we would select two designs for use in the Challenge, seven designs were nominated, including two sent in by absent members. After discussion, a weighted ballot (5 points for a first choice, 4 for second, etc.) was distributed for a vote. The results were:

CUSHION HALF BARION, a design by Robert H. Long
Long & Steele, Vol. 6, p C-36
Nominated by member Duane Luce, Linville, NC

FVS-141, THE EAGLE-EYE CUT, a design by Fred W. Van Sant
Star Cuts III, p 141
Nominated by member Don Dunn, Dayton, OH

(The materials to be used and the sizes, when determined, will be announced in the official Challenge Schedule in the very near future.)

Much discussion of the Australian choices of designs for the 1994 Challenge followed, centered principally upon the possible use of FVS-17. THE HONEYCOMB CUT. It was finally decided that the American Chairman/Coordinator, when chosen, would be asked to communicate with his Australian counterpart, suggesting that they might want to reconsider this choice. A somewhat similar design, the Checkerboard Barion by Sid Word, was to be suggested as an alternate. The use of a + or - 0.05mm tolerance on the second Australian choice was deemed unattainable by a consensus of those present, and this, also, was to be communicated to them.

The subject was then raised concerning a set of International Faceting Rules, as previously suggested by Fred Van Sant to the Australian Faceters Guild. By vote of those present, it was agreed that the USACF would support this effort, and that Fred would be the official USACF communicator with the AFG on this matter. All agreed that an international set of rules probably could not be agreed to in time for the 1994 Challenge and that the use of Australian Rules, as decided by the Australian Committee, was a logical and necessary choice.

Fred Van Sant then brought up the subject of a Faceting Dictionary, upon which he and others have previously consulted. The question of USACF sponsorship was raised, and by a vote of those present unanimously approved. Fred will continue his work on this much-needed addition to our references.

Discussion of possible choices for the USA Chairman/Coordinator followed. It was moved by Fred Van Sant and seconded by Charlie Hettich and John Alden that Walt Carss be so nominated. The motion was unanimously approved, and conditionally accepted (subject to affirmation by the Australians that members of the USA Committee might also participate in the competition). (Note by the Secretary: Anyone who objects to this choice immediately has the job!)

A Treasurer's Report by Lillian Hettich was presented to the President and others in attendance. In summary, our organization is comfortably solvent but far from wealthy.

The meeting was then adjourned.

NEW CUP CHAIRMAN, 1992 TO 1994

Walter Carss of Texas has agreed to take over the job of Cup Challenge Chairman for the coming two years, 1992-1994. Charles Moon has done an excellent job for the past two years; this next round will present some new problems, as the Australians appear willing to make some changes. Ed.

TREASURERS REPORT

Lillian Hettich has been keeping an accurate record of our income and expenditures. She furnished those at the meeting in Hayward with complete copies. We should feel fortunate to have her working silently behind the scene keeping tab on everything. We are gradually building a kitty for the time when we will host a truly international competition. Perhaps 1996 will be it. Our outlay so far has been mainly connected with this bulletin. To date we have $965.50 to our credit. I think we should target 1996. It seems a long way away right now but it's not too soon to start thinking about it.

MEETS

The judging of meets on the Cup stones was one of the least clear topics in Australia, according to Jean Marr, Glenn Klein, Don Dunn, and others who were there at their judging school. What was clear is that it is an all or nothing affair which no one here felt comfortable with. I don't know what to call their method since I have no description of the judges procedures.

In discussing meets, as with polish, we will assume that a lighted facet is one being viewed in half-light, that is, never with the central part of the light source reflecting to the eye. In speaking of lines on the stone we will mean the edge where the lighted facet changes to a dimmer adjacent facet.

Years back when I did some judging, I looked at each facet that failed to reach the meet, or overran the meet, and took off points based on how extreme the error was--anywhere from a tenth of a point for a narrow miss to a whole point for a gross one. It was pretty subjective; there were no instructions about how the judge was to examine the meet. This 'method' of scoring meets we can call #1.

In thinking over the problem, a couple of other methods of scoring meets has occurred to me.

Every meet should consist of only one point. If one facet falls short (a shortfall) then there is an extra point formed; if two facets fall short then two extra points are formed. If a facet overruns the meet then extra points are formed along all the lines leading into the meet. So would it not be possible to simply count up the extra points and mark an error for each extra point ? If the extra point is so close to the meet that the judge cannot see it with a 10X magnifier we can simply say, as we do with scratches, that it doesn't exist. This method we can call #2, the Point Method.

But points, in themselves, are nearly impossible to see; they can only be inferred by looking to see if lines come to a sharp point or not, so is the Point Method practical? Can a judge count up the extra points by examinig lines coming into the meet?

Something else: I have pointed out before that in looking at meets it is best to see facets evenly lighted. This is not always possible unless you have special lighting. However, it is easy to see a single lighted facet or two adjacent facets evenly lighted. Therefor the judge can examine each meet by looking at the two lines of a single facet, or 3 lines for a pair of adjacent facets. in either case the lines must come to a sharp point. For pairs of adjacent facets there will always be the same number of pairs as there are single facets around the meet. The judge can mark an error factor if any one set of lines do not come to a precise point, without consideration of where that point is, since there may be one or more extra points at the meet, and there has to be at least one extra point if any set of lines fail to point. This method we will call #3, the Line Method. In judging by this method the judge can look at lines that cross the meet and see if there is a jog in them.

It appears that the most practical way to judge meets is by looking at lines; it is also the best way for the cutter to view meets when polishing.

One thing we do not want is to force the judge to make any interpretation of what is wrong with the meet. He should not have to decide which facet is short or which one overruns the meet, or where the true point should lie. Of course the judge would first look to see if the meet was perfect, and if it were he would look no further.

I think we might all benefit if we take out a few of our stones and try scoring our own meets according to these various methods, using a 10X magnifier. See which you like or don't like and write in your results. See if you can discover any general laws which relate the number of extra points with the number of 2-line or 3-line sets which fail to meet.

It is possible to assess degress of offness to meets. If there are two points, how far apart are they? If a line jogs, how big a jog?

You might just discover new ways of looking at your meets which will help you improve them. Keep learning how to look; you can't cut any better than you can see. You should be using at least twice the magnifying power that the judge uses on your stone; you need that error cushion to protect you. If you use the same power as the judge you may lose because he has better eyesight than you do.

You have a chance to help make the rules you compete under. I hope to hear from many of you and await your findings with interest.

FVS

Member Profile Sheet

Since we are a small family, to assist us in becoming acquainted with each other, here is a guide to help you cover all the points you may wish to furnish to your editor so he can write a small article about you, especially the things important in your life, and the things you have found good for faceting stones.

Your name.

1) What kinds of work have you done in your life ?

2) What are some main interests you have ?

3) What other hobbies do you have ?

4) What kind of Faceting Machine do you use ?

5) Do you have other faceters nearby you compare notes with face-to-face ?

6) Do you like to compete ? Why or why not ? (rules you like or don't like, judging procedures, handling of stones, judging sheets and remarks, return of stones, awards, etc.)

7) What laps have you found that work well ?

8) What laps have you found do **not** work well ?

9) How do you polish quartz ?

10) How do you polish CZ ?

11) What polishing agents do you use ? For what materials ?

12) What dopping techniques do you use ?

13) What stone transfer techniques do you use ?

14) What other special or individual faceting techniques have you learned that work for you ?

15) What types of stone errors (meets, polish, etc.) give you the most trouble ?

16) What kinds of articles do you want to see more of in this newsletter ?

Please feel free to make longer replies on separate sheets of paper. Make copy of this sheet and return all to the editor. Use the above Numbers for additional notes. Black & White photos also useful. Return to this editor at the address given on the officer list on page 2. FVS

REFLECTIONS ON THE FACET JUDGES TRAINING COURSE

This is a brief summary of my experience in the Facet Judges Training Course given by the Australian Facetors' Guild Limited in April 1992 in Perth. I was first impressed by the time and effort that was obvious in the organization of this class. We were given a training manual outlining in detail the areas to be covered along with the specific time frames allotted. The instructors, Jenny King and Arthur Roffey were experienced teachers and were very familiar with the material. Jenny was able to bring us back to task when we strayed from the topic at hand. I also appreciated her lowering our stress levels by omitting a formal practical judging test. We did have an open-book written test, and our practical judging was compared to experienced judges' scores. The atmosphere was also designed to help us to be relaxed and learn more effectively. The course was held at the home of Jack and Judy Tuffley, (Jack placed second in the competition). They were very kind to open their home and their hearts to us, and were very gracious hosts. We were treated to morning and afternoon tea each day as well as delicious lunches!

The course itself began by covering equipment, methods of judging, rules of competitions, and then moved into studying the judging features and how they apply to both standard and fancy cuts. The features which are judged include: visual effect, outline of girdle, table parallel to girdle plane, meets pointing up [meeting], facets uniform, facet edges sharp, facet surfaces true, scratches, polish, chips, flaws, girdle uniform, girdle too wide, orientation of crown and pavilion facets, and foreign surface material. Most of these features are fairly straightforward, with two exceptions. The features presenting the most difficulty are visual effect, and meets pointing up. Visual effect refers to the "area of the stone...reflecting light back to the eye." For example, a fisheye or dark ring would lose points. The meets pointing up feature is scored from the percentage of meet points meeting EXACTLY. This is judged under 10X with a 40W incandescent lamp. There is no "close" in meet points, a meet is either in or out.

My feeling is that the two countries have a different orientation or perspective. I believe that the Australian purpose is to be given a design and to cut the best possible stone from the material. The American perspective is, when given a design, to cut that design exactly as written. When there is a difference, they may cut to the picture where we cut to the angles given.

Since this is the first judging school I have attended (aside from the Colored Stone Grading course given by GIA), I cannot make comparisons with courses that are offered here. I personally would like to see a consistent set of national judging standards in place (such as the USACF Single-Stone Rules), similar to the Australian judging system, which is nationally recognized in that country.

I understand that the Australian Facetors' Guild is a member of their Federation, which allows for greater visibility of lapidary arts (cutting in particular). Perhaps we could explore the feasibility of such an arrangement here. I would also like to see if we can look at both sets of rules, find commonalities, and then search for ways to resolve the differences. I think we have a chance for a real dialogue on these issues and would like to see us take steps in that direction.

Dr. Jean A. Marr - 9 June 1992

Editor's Response to Dr. Jean Marr's Comments:

I agree with Jean that, at some point in time, we should form some kind of tie with AFMS. But I do not feel that this is the time. We need to be free to follow our own choices while we are in the creative period of growth. In the area of rules and judging of faceted stones we have the edge. We have the new ideas and the flexibility. AFMS has had so many problems in the past year in their attempts to reformulate their faceting case rules that a link with AFMS at this time would probably be more a hinderance than a help to us. For whatever reasons, at the Calif. Federation Show last year only one case was entered in competition. This year at the Calif. Federation Show NO faceting cases were entered. Yet California has many fine faceters, perhaps more top cutters than any other state. How many of you members have ever been asked by a representative of AFMS why you do not enter a case in their faceting competition? If you were, were your comments or suggestions ever followed up or implemented ?

AFMS is opposed to Single-Stone Competitions, an opposition based on their contention that the hobby will die out unless a continuing supply of younger people are brought into the hobby, and the best way of accomplishing this is with attractive cases of stones and a stress on educating the public.

As far as it goes, there is nothing wrong with this stand by AFMS. But it is far from the whole picture. Faceting is in a class by itself. The equipment and rough are expensive, and many cannot afford it until their mid-years or retirement years. More than any other of the lapidary arts except jewelry-making, faceting is entered into with the hope of making a profit, or at least breaking even financially. This attraction will always continue to draw people who have the time, especially retired people, into the hobby. Do the people in charge at AFMS really know what percentage of faceters have gotten into the hobby because of shows and case displays. I doubt it. I think they are going purely on assumptions. Faceting will never die out. The attraction of beautiful cut stones will always be there, and so will the reward of seeing one's own stone flashing color. AFMS's worry is unfounded.

More Cup Challenge Results

by Fred Van Sant

John Alden has been collecting the Score Sheets for the recent competition in Australia. He has all of the USA entrants and six of the Australian entrants. There is no way we can analyze and compare the team scores until we get the remaining score sheets from the top five Australian cutters.

To assist John in analyzing the Raw Scores, I have written a small program for the Macintosh which computes the sums, averages, standard deviations, and displays a scatter plot of any two of the 14 judging features plotted against each other.

Standard deviation is a measure of variance--how much the scores for any feature vary away from the average. Two factors contribute to variance: variation in the cutters skill from one stone to another, and variation in the judging of the stones. We have no way of telling which of the two is the main cause of the variance we see. If we assume each cutter is trying equally hard to cut the best he or she can, the figures may be useful in pointing to a possible variance in judging.

Among the scatter plots, Visual Effect does not appear to be related to Polish, Meets, or any other of the several features which should mark the difference between the best and worst cutters. The highest Visual Effect scores are scattered fairly evenly across all cutters. The only stone feature which shows some relation to Visual Effect is the Average Brightness percent for the design.

The Faceting Dictionary

In the pursuit of standards, the USACF is sponsoring the following Faceting Dictionary. The aim is to promote better communication between writers and readers of articles on faceting, between designers and cutters on design sheets, and between judges and competitors in contests.

This is the first edition of what we hope will be an ongoing project; one which belongs to everyone and to which we hope everyone, not just USACF members, will offer their contributions. The members at our August meeting have asked your editor to continue on as chairman of this project, which now consists in receiving requests for new definitions and redefining the current ones. The only cost to USACF will be a minimal amount of postage. The dictionary will be periodically revised to reflect your recommendations, at intervals depending on the number of changes made. Not all recommended changes can be included; if your definition conflicts with an existing one it will have a better chance of being included if you also include a solution of the conflict. It may be that a whole set of terms can be better defined. Some terms, such as those used in ray-tracing, will become defined as programs become more sophisticated. We sincerely hope all guilds and individual faceters will join us in this worthwhile project. Please send your suggestions to the editor of USACF. This invitation is also extended to our many friends overseas. FVS.

FACETING DICTIONARY
September, 1992
edited by Fred Van Sant

Adjacent Facets: Two facets on a stone which form a line between them. If facet A shares a line with facet B they are adjacent.

Angle: Used alone, "angle" refers to the angle which a facet makes with the girdle plane.

Apex: A single point on the crown farthest from the girdle plane.

Apex Facets: All facets meeting at the Apex. If there is a Line Apex, then these are both facets forming the line plus all facets meeting at either of the two points on the end of the line.

Arc: A smoothly curving line which is a segment of a circle. The term "arc" usually refers to a girdle section made using an offset device.

Baroque, or Freeform: A stone which is non-symmetrical in shape, and lacks repetition of any pattern of facets at regular intervals.

Bearing, Bearing Angle: The angle of a facet's normal intercept, as measured on the girdle plane. This is also called the "Circumference Angle", and is used mainly for describing girdle facets. The Zero Degrees line lies on the X axis, to the right of the Point of Origin.

Break Facets: The first row of facets on the crown of pavilion, which form the crown or pavilion side of the girdle. On the crown side they are called the Crown Break Facets, and on the pavilion they are called the Pavilion Break Facets.

Brightness: The amount of light returned back through the crown, expressed as a percentage of the light which entered the crown. The determination of brightness may be expressed as a subjective evaluation, or as the result of a computer analysis; in the latter case it is relative to the lighting model used and other program characteristics.

C: The height of the crown as shown on the diagram sheet. It is measured parallel to the vertical axis of the stone

CAM: The Centerpoint Angle Method of making a preform. 1) Facets are cut to a temporary centered culet point at given angles and indexes. 2) The dop arm is then set parallel to the lap (90° on protractor), and a set of facets are cut using the same index numbers to make a level line around the stone. This results in the desired preform shape.

CAM Facets: The sets of facets—their angles and indexes—which are used to make the CAM preform.

CED: Center-to-Edge Distance. This refers mainly to a girdle facet, and is the length of its normal intercept on the girdle plane.

Cheater: A bearing angle adjustment which allows 'indexing' between teeth. This is usually a worm gear with a knob that can be turned by hand.

Circumference Angle: See Bearing Angle.

CLAM: The Corner Locator Angle Method for locating a corner on a preform.

Cone: A rolled facet shaped like a cone, whose point is centered on the dop arm axis.

Cone Point: The point of a cone, usually made to serve as a temporary or permanent center point at the culet.

Continuous Girdle: One which has no vertical break line, as in an oval or circular stone where the entire girdle is polished by rolling the stone on the lap.

Crown: That part of the stone above the girdle.

Crown Break Facets: see Break Facets.

Culet: 1) A small facet parallel to the girdle plane made to prevent chipping the culet point; 2) A single point on the pavilion farthest from the girdle plane (preferably called the Culet Point); 3) A bottom line on the pavilion parallel to the girdle plane (preferably called a Culet Line); 4) Definition 2 or 3 plus the facets attached – the area of the culet.

Culet Area: see Culet 4) above.

Culet Point: see Culet 2) above.

Culet Line: see Culet 3) above.

Culet Facets: All facets meeting at the culet. If there is a Line Culet, then these are both facets

forming the line plus all facets meeting at either of the points on the end of the line.

DPT: Degrees Per Tooth: This is equal to 360 divided by Gear Number.

Direction: The rotational direction in which the index numbers increase in magnitude on an index gear or on the diagram sheet. It is either Clockwise (**CW**) or Counterclockwise (**CCW**). The highest number on the index gear normally lies on the Y axis of the plan view.

ECED: (Equal Center to Edge Distance) This term refers to the length of an imaginary line on the girdle plane which extends from the center of the girdle plane to connect at 90 degrees with a girdle facet, as seen in a plan view. A design labeled ECED indicates the stone can be preformed at a single mast height setting. See also Normal Intercept.

Elevation: The height of a point above the girdle plane. In discussing pavilion points, assume stone is held upside down as you would normally do when examining the pavilion, so all point elevations are positive.

Elevation Angle: The angle a plane or facet makes with the girdle plane. See also Angle.

Ellipse: A curving line whose every point conforms to a precise mathematical formula.

Elliptical: A stone shape whose perimeter is an ellipse.

Facet: Any bounded surface on the stone. A facet is not a plane, but flat facets are small areas of the plane on which they lie.

Facet Edge: See Line.

Faceted Girdle: A girdle made up of a series of flat facets. In the plan view they appear as a series of straight lines.

Feature: Any element or aspect of a stone which is defined as something to be judged. Same as an Error Category in the USACF Single-Stone Rules.

Finder Fluid: A liquid having the same or similar refractive index as the rough material you wish to examine.

Fixed Point: Any point where four or more facets meet, as opposed to floating point.

Floating Facet: A facet whose perimeter points are all floating points. The facet is not anchored to a fixed point, so its size is adjustable.

Floating Point: A point formed by only three planes.

Four-Part Design: A stone whose facet pattern consists of four quarters which mirror each other **BOTH** left/right **AND** top/bottom in the plan view, such as the Oval, Square, Hexagon, Rectangle, Lozenge, and Marquis.

Freeform: See Baroque.

Gear Number: The number of teeth on the index gear; the highest numbered tooth on the gear.

Girdle: The girdle is a thin cross-section of the stone situated between the crown and the pavilion and at 90 degrees to the vertical axis. Its perimeter may be faceted or continuous or a combination of both, and is usually parallel to the vertical axis.

Girdle Plane: A theoretical plane inside the stone in the center of the girdle, at 90 degrees to the vertical axis.

H: H is the total height of the stone as shown on the diagram sheet. H=C+P+.02

Index Gear: A toothed wheel used on faceting machines for setting the circumference angle.

Index Line: A line whose slope, divided by DPT, results in a whole number. The lines of a faceted girdle and the lines around a table will all be Index Lines unless they have been cheated.

Index Number: The number of the tooth on the index gear. Teeth are numbered consecutively in whole numbers, starting from the highest number, which is also number zero, around the gear.

Index0: Index Zero refers to the highest number on any gear. This is useful for discussing gears in general, or a general rule.

Keel: The bottommost line on the pavilion, one end of which is the culet point. This is like a line culet except that it is not parallel to the girdle plane.

L: The length as shown on a diagram sheet. This is normally the longest dimension on the girdle plane. It usually lies along the X or Y axis.

Level Line: A line whose points are at the same elevation.

Line: A line, or ridge, or facet edge, on the stone is the juncture of two (adjacent) planes.

Line Lengths: On a design sheet, the length of a line is given as a ratio of W, and the line is indicated by a lassoo whose loop encircles the line.

Line Apex: A line on the crown parallel to the girdle plane and farthest from it. This parallels the Line Culet definition.

Line Culet: A line on the pavilion farthest from, and parallel to, the girdle plane.

L/W: The length/width ratio, where length and width are designated on the diagram. Both measures are on the plane of the girdle. L/W is never less than 1.

Main Facets, Crown or Pavilion: A set of large facets which extend from girdle to table on the crown, or from girdle to culet on the pavilion. Note: Facets which meet at the Culet Point have been called the Pavilion Mains, but the term "Culet Facets" better locates them.

Matte: The surface of an unpolished facet. Such facets may also be referred to as opaque. The surface should be evenly matted and free of pits of any size other than those created by the lap used to leave the matted surface. The facet is generally flat, but an exception is a domed, matted, crown, which should be a smooth curve.

Meetpoint, or Meet Point: Any point on the stone used in meetpoint cutting. A point to which a facet is cut to meet. This is a functional term used only in Meetpoint Faceting.

Meet, or Meets: A term used strictly in judging to refer to the points on a stone, and how well facets come together at a point.

Normal: The bearing and length of an imaginary straight line in 3D space, which is connected to a line or plane at 90 degrees, and connects at its other end to a distant point. The shortest distance between a line and a distant point.

Normal Intercept: Same as a Normal except the distant point is the Point of Origin.

Oval: A shape which is more or less eliptical.

P: The height of the pavilion as shown on the diagram sheet.

Pavilion: That part of the stone below the girdle.

Pavilion Break Facets: see Break Facets.

Plane: A geometrical flat surface, having infinite two-dimensional extension. Flat facets are restricted areas of the plane on which they lie.

Plan View: A view looking down the stone's vertical axis at the crown, or up the vertical axis at the pavilion.

Point of Origin: The center of the Cartesian, or Rectangular, coordinate system, where the X axis, the Y axis, and the Z axis intersect.

Preform: A piece of rough material with a set of facets at 90 degrees or a curving girdle at 90 degrees which, when the stone is viewed along the vertical axis, has the same shape as the design to be cut.

Protractor: The vertical-angle indicator on a faceting machine. The protractor should read 90° when the dop arm is parallel to the lap.

Race-Track Oval: An oblong shape whose sides are straight parallel lines and whose ends are half a circle.

Ratios: On design sheets ratios are set to the stone's width, W, wherever feasible. The ratio C/W = .17 means that the height of the crown is seventeen percent of the stone's width.

Reference Point: Any point on the stone, permanent or temporary, to which a facet can be cut. (a catch-all term)

Rhomboid: A stone whose general shape is that of a parallelogram.

RI (Refractive Index): The ratio of the speed of light in air divided by the speed of light in the selected medium.

Rolled Girdle: A girdle section made by setting the dop arm in free-wheeling, and turning it

while grinding or polishing the girdle. If there are no verticle break lines then is is called a "continuous girdle".

Set, or Sets, of Facets. Facet Set: Several facets having the same shape or mirrored shape, and the same surface area, which occur at patterned intervals around the stone.

Shape: The stone's shape is its outline form when viewed along the vertical axis.

Side View: The side view is any view looking along the girdle plane, at right angles to the vertical axis, with both crown and pavilion in equal view. The terms Top View, Bottom View, Left View, and Right View are all side views, which refer to the edge of the diagram sheet from which the crown plan view is being observed.

Slope: The angle a line makes with respect to the X axis, as measured on the girdle plane. Each uncheated girdle facet and table facet has a slope which corresponds to the that facet's index number times DPT.

Sloping Table: A large facet on the crown which functions like a table, but is not parallel to the girdle plane.

Split: A facet is said to split two facets if its index number lies halfway between theirs.

SRB: Standard Round Brilliant.

Staggered Facets: A set of facets whose index numbers evenly split the index numbers of the set of facets below it or above it.

Step Facet: A facet having the same index number as an adjacent facet.

Symmetry: This refers to the **pattern** of facets on the stone. In general parlance, there are two kinds of symmetry, **mirror-image** symmetry and **rotational** symmetry.

Mirror-image symmetry is illustrated by folding a design plan view along its X or Y axis so that the two halves overlap, with points and lines coinciding, but the folding is confined to the vertical and/or horizontal axes.

Rotational symmetry is illustrated by a pie, where each slice is the same as every other slice. A design may have both mirror-image and rotational symmetry. The term "symmetry" will not be used to denote similarity of shape among facets of a set; that is referred to as "Uniformity". Also the term Symmetry will not be used to describe the outline of the stone or the outline of the table as to how even it is.

T: Table width as shown on a diagram sheet.

Table: A facet on the crown parallel to the girdle plane.

Tangent Ratio: The ratio of the tangent of one angle to the tangent of a second angle. Used for translating one set of angles to another while holding the plan view constant.

Tier: A tier of facets consists of a group of facets at the same elevation around the stone. It may be made up of one or more sets of facets.

Two-Part Design: A stone whose facet pattern consists of two halves which mirror each other left/right **OR** top/bottom in the plan view, such as the Pear, Heart, and Shield.

Uniformity: The degree of sameness of the facets within a facet set as to their size and shape (or mirror-image shape).

Vertical Axis: An imaginary straight line through the stone which, as in a standard round brilliant, runs through the center of the table and through the culet point.

View Arrow: An arrow on the diagram sheet which indicates, in a sideways view, how the crown plan view is being seen.

W: The width of the stone as shown on a diagram sheet. Usually at 90° to the Length dimension.

X-Axis: An imaginary line passing left-to-right through the center of the plan view. The left-right direction on the diagram sheet is when it is held in the position to read the text.

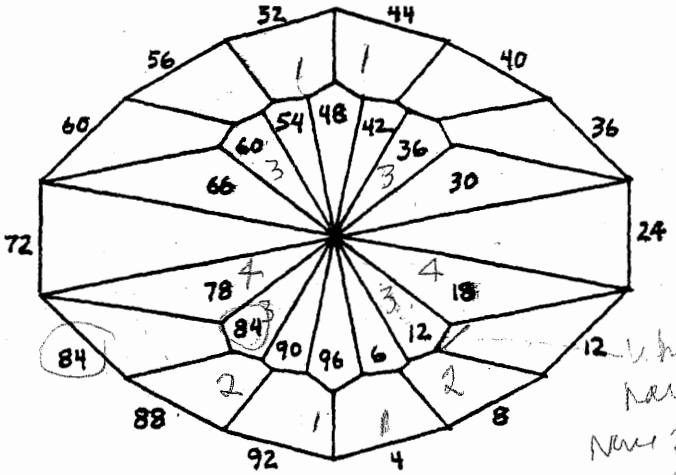
Y-Axis: An imaginary line passing top-to-bottom through the center of the plan view. The vertical direction on the diagram sheet is when it is held in the position to read the text.

Z–Axis: An imaginary line at right angles to the X and Y axes. Usually the same as the vertical axis.

Zero Vertical Loss Method: A method used to compute CAM angles, such that the culet point made for the CAM preform can be the permanent culet point. (used in FVS's "GEM" program.)

What's Wrong With These Designs ?

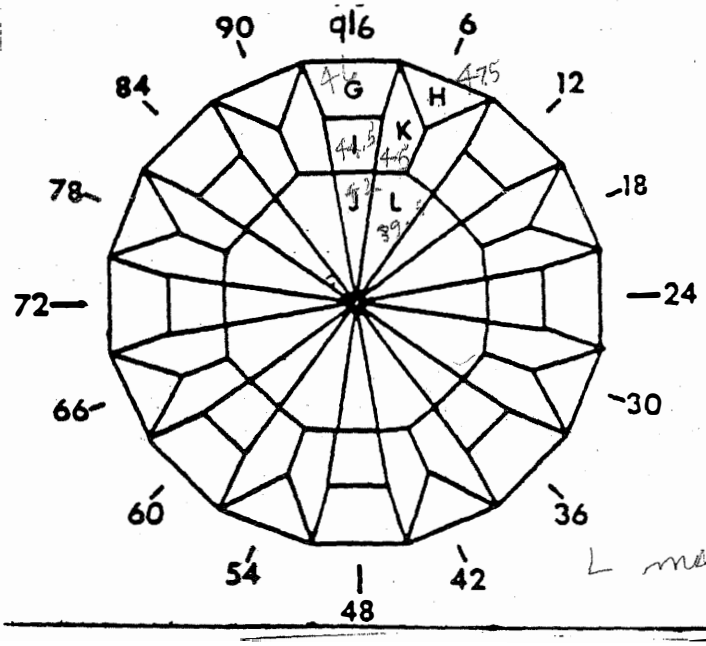
In each of these designs there is something wrong which you should be able to spot. Nothing is needed but your powers of reason. The answers are given on page 17.



Pavilion:

1. 4 at 60.00° I 92,4,44,52.
2. 4 at 58.00° I 8,40,56,88.
3. 4 at 52.00° I 12,36,60,84.
4. 4 at 41.00° I 18,30,66,78.
5. 10 at 41.00° I 84,90,96,6,12, 36,42,48,54,60.
6. 2 at 41.00° I 24,72.

Designed by Fred W. Van Sant

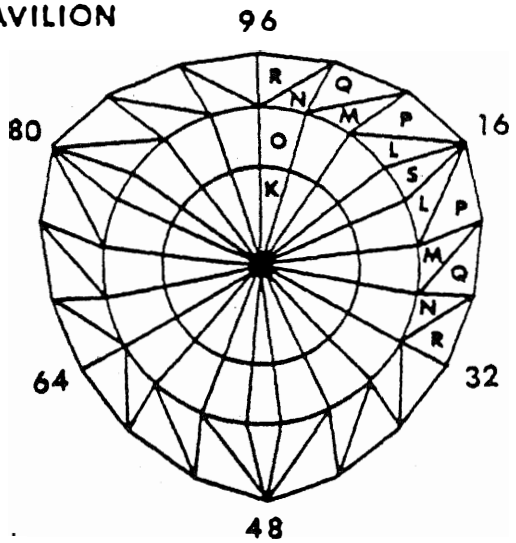


PAVILION — Designed by Robert A. Gregory

Angle	Index
G-46°	96-12-24-36-48-60-72-84
H-47.5°	06-18-30-42-54-66-78-90
I-44.5°	96-12-24-36-48-60-72-84
J-42°	96-12-24-36-48-60-72-84
K-45°	03-09-15-21-27-33-39-45 51-57-63-69-75-81-87-93
L-39.5°	06-18-30-42-54-66-78-90

L must be higher than J

PAVILION



Angle	Index
K-42°	93-03-08-12-16-20-24-29 35-40-44-48-52-56-61-67 72-76-80-84-88
L-47°	84-12-20-44-52-76
M-50°	88-08-24-40-56-72
N-56°	93-03-29-35-61-67
O-44°	93-03-08-12-16-20-24-29 35-40-44-48-52-56-61-67 72-76-80-84-88
P-49°	85-11-21-43-53-75
Q-55°	90-06-26-38-58-70
R-58°	94-02-30-34-62-66
S-44°	16-48-80

Designed by Sid Word

California's John Alden Still Reaches For the Ultimate in Competition Cuts
(reprint of article in Gemcutter, Jan., 1988)

(For a faceter who came into the craft through the side door, California's John Alden has plenty to show for his efforts. One of the top competitive faceters in the country, the retired 70-year old industrial engineer turns out some of the finest cut stones in the country on the modified Prismatic machine he uses in his Hayward home.

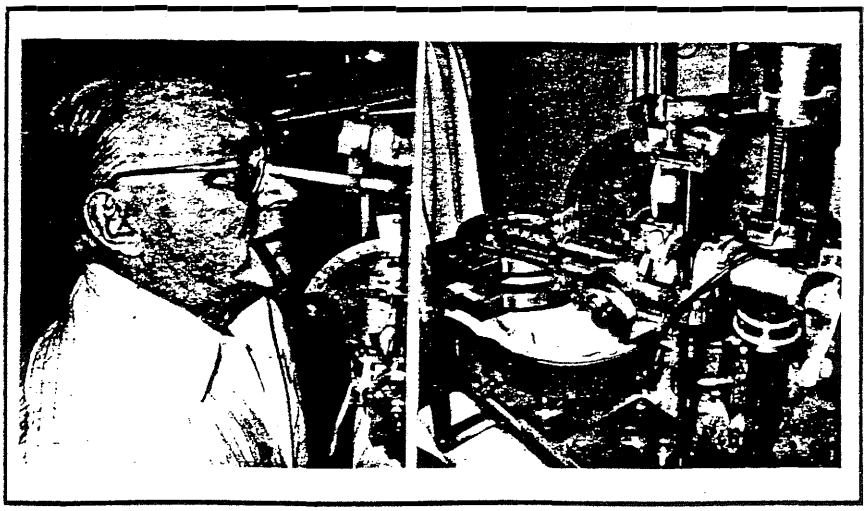
Originally he'd bought the machine for his wife. Marian, but then started fooling with it himself and caught the gemcutting bug. Soon he was winning awards--and happily shocking people with the Rube Goldberg-like modifications he made to the used machine he'd bought. Today it's probably the most accurate machine in the country.

In his career, the University of California graduate has gone from the huge harbor cranes in Vietnam to the Alaskan pipeline to racing high speed boats. Taking it a bit slower now, he's even into teaching faceting to his nephew. The young man recently walked off with a top faceting prize.

A perfectionist, Alden still seeks to cut the perfect stone--a round brilliant. 'That would be the biggest accomplishment of all," he said, "because it's never been done that I know about."

GEMCUTTER: Let's start with your polishing techniques. Do you ever use acid?

ALDEN: The only one I'd use is vinegar on a tin lap. What I do is wet a rag with vinegar and then wrap the lap in it. I let the wrapped lap sit for a day or two to build the tough oxide film. Generally, I acid treat a tin lap only after I've "turned" it.



GEMCUTTER: In your experience, how long does the oxide film last ?

ALDEN: As with most things. it depends on the amount of use and pressure. But an acid induced film is very tough and it'll last a good amount of time.

GEMCUTTER: Do you observe an improvement when you use an acid treated metal lap ?

ALDEN: It seems that there is an improvement in speed and polishing ease. I'll tell you one thing, though. it puts a quick end to most of the scratching problems you'll usually encounter.

GEMCUTTER: Many prize winning faceters don't sweep a stone across the lap when grinding because it contributes to rounded facets. What's your opinion?

ALDEN: If you're working on a large facet and sweeping it then you're working with different radii and that causes rounded facets.

The theory is that the heat effects the crystal. The crystal literally expands as it takes on heat. which is why it's good cutting practice to keep your finger on a stone to monitor temperature build-up.

In electronics, as you know, a semi-conductor is mounted on a heat sink to avoid the different expansion coefficients of different materials. It works the same way with crystals. In a stone, the edge of the facet gets hot quicker than the center and expands down onto the running lap, which removes material.

The stone then cools and you have rounded facets. The best solution is to keep the stone from getting heated up.

GEMCUTTER: When you're cutting for competition, what is your normal polishing procedure?

ALDEN: Well I regard, for contest purposes now, the final prepolish to be 50,000 grit and then I polish with 100,000 and/or 200,000.

I can show you two stones with 100,000 and 200,000 polishes and ask you which has the finer finish--and it'll be hard to tell the difference. Polishing, to me anyway, is a lot like color grading: a lot of subjective elements enter the equation. When two stones are polished with diamond of this fine grit you can hardly tell the difference. But if two adjacent facets are compared, one polished with 100,000 and the other with 200,000, then the difference becomes apparent.

That's why I say it's like dcolor grading. You really need a comparison to do it properly. All competition polishing is with 200,000 although it

really depends on the material you're cutting. Competitive cutters like corundum because it's so hard that a 200,000 grit 'takes' beautifully. Quartz would be another matter.

GEMCUTTER: But I believe you said earlier you avoid chemical polishes. Quartz--for most cutters--polishes best with cerium oxide or Linde A on a Lucite lap. And you don't use diamond grit with an acid treated tin lap do you?

ALDEN: I said I avoid oxide polishes, but I don't do without them. I don't like them because they're messy and the water tends to leave trails. As I said before, you can see them if you look closely enough.

GEMCUTTER: Why does competition cutting generally lend itself to synthetics, particularly corundum?

ALDEN: With so many shows and competitive events, the cut, size and material are practically given to you. As a result the cutter is forced to go to synthetics because of the uniformity of the material.

Contest cutting is usually synthetic because the cost of the materials, too, could eliminate a lot of people. Natural material can be too expensive and then the competition would be for the better materials.

At least, that would enter into the equation--and that's not good for competitive cutting. A show or competition is for workmanship only.

GEMCUTTER: But natural stones would challenge the cutter's ability to accommodate varying conditions?

ALDEN: The challenges would all be different, wouldn't they? I mean one cutter has bubbles in the crown; another places them in the culet and another has them off under the crown facets where they can be hidden.

If a cutter is going up against another then the standards should be uniform Synthetics give you that, and allow you to pit your cutting skill. Some other contest with its own rules would be needed to judge the ability to manage various pieces of rough.

GEMCUTTER: I would assume you place a high premium on prepolishing?

ALDEN: I should say so. That's where a contest is won or lost. Without a good pre-polish your polish will go nowhere.

GEMCUTTER: And the John Alden formula?

ALDEN: I do my pre-polishing on an 8000 Fast Lap. Now that's finer than a 14,000 lap. The Fast Lap is a true wonder and it will give you precise, smooth facets that are truly ready for polishing.

Keep in mind that 8000 won't work on a ceramic lap: the resultant finish looks like hogwash.

Also, copper with 8000 is smoother than 8000 on cast iron. I use the cast iron with 600 for coarse cutting: it works beautifully.

GEMCUTTER: What is your procedure for beginning the polish?

ALDEN: Well, I put the facet down close to the lap surface, about 1/16th" off the surface and with a very light pressure I move it across the lap once. Then I loupe it to determine where the contact was made.

If necessary, I make any adjustments and then go ahead with the polishing. When the stone is oriented properly to a ceramic lap, the polishing is rather rapid.

(Ed. note: John no longer uses a ceramic lap. He uses a fine metal lap which he makes himself.)

GEMCUTTER: Do you prefer to get your meet points precise in the prepolishing phase or do you wait until polishing and drift in any meets that are off slightly?

ALDEN: I've never been one to re-invent the wheel so I make the meet points as exact as possible in the pre-polishing. This way, if I locate one that could be a little more precise I can do it but why try to do grinding work in polishing. I believe it's easiest to polish to the point created in the pre-polish because you know they match.

GEMCUTTER: Let's change the subject. How about dopping? What are your preferences?

ALDEN: I've tried everything. Most of it works and most of it fails--at one time or another. When I'm ready to cut a peice of rough I eyeball it with the objective of finding the best table flat location. If I find a flat, that's OK, or I dop the stone and cut a flat on the machine, finishing with a 1200 grit.

GEMCUTTER: Do you ever hand-hold while cutting a table flat?

ALDEN: No, it rounds the edges too much when you hand-hold. I don't want that. On the machine I can get it nice and flat.

I clean the flat with methylethyl ketone by painting it and then do a quick wipe of with the dry part of a Kleenex...

GEMCUTTER: You need good ventilation with MEK, which is a powerful cleanser, but has the disadvantage of dangerous fumes, right?

ALDEN: Right. Anyway, once I'm ready to dop I use a lead pencil and draw in an "X" where I want the center of the dop. I place two drops of superglue on the X, attach the dop and hold the two firmly for about 15 seconds until it sets up. Then I set it aside for about 15 minutes for the bond to develop securely.

GEMCUTTER: How about summarizing the ALDEN procedure for avoiding trouble with superglue as a dopping medium?

ALDEN: Here are the steps I follow:
1) I use flat dops, no Vee or Cone dops. 2) The rough surface should be 1200 to eliminate voids (8000 is OK but don't polish because you want some roughness for the adhesive to grab). 3) Clean all surface thoroughly (oil is a terrible superglue enemy). 4) Flat matching surfaces on the stone and the dop. Most superglues won't fill voids so no target dops or perforations on top of the dop. 5) Use only a small amount of glue...on one small wetted area.

GEMCUTTER: What is your method of transferring? And how do you break the bond with the superglue without endangering the second attachment?

ALDEN: Once I've cut the pavilion I put the dopped stone in the transfer block and secure the second dop with 2-part epoxy. There's a special industrial formulation that I find is excellent called Epoxylite. (Gemcutter Editor's note: The formulation is a 50-50 mix and consists of Repair Kit #223, made by the Epoxylite Corporation of Irvine, CA 92713).

Removing superglue from the first dop is no problelm. I wrap a strip of wetted Kleenex around the epoxy attachment to keep it cool and then direct the alcohol torch heat to the first dop. I watch the adhesive with a loupe and at the first bubble I stop and allow the dop to return to room temperature. The dop will fall off.

GEMCUTTER: After all the cutting you've done, what is your favorite lap and what is your least favorite?

ALDEN: That's easy. If I get only one lap to do a stone I'd reach for a Fast Lap.

As for the other answer, they can take the new 3000 lap and put it back in the barrel. It'll cut a bit the first time out of the box and then clog up and that's the end of its usefulness. I have two and I'll use them for weights the next time I go Salmon fishing.

GEMCUTTER: If I asked you for the toughest cut of all what would be your answer?

ALDEN: That would be a round brilliant--with a smooth, polished girdle. I don't think I've ever cut more than a 96 or 97 with that stone.

The smooth, polished girdle--now that's not a faceted polished girdle--will reveal even the slightest cutting error. It's really a tough one.

GEMCUTTER: If you were advising a starting faceter to cut a fine SRB stone what procedures would you emphasize?

ALDEN: I suggest that he or she rough out the stone point to point with a 600 grit. A 100 lap is good for heavy removal but get the eight mains close.

Then I'd suggest cutting the girdle at 89 degrees. If it's to be a faceted girdle, then cut 16 facets. By cutting at 89 degrees you can polish the girdle at 90 degrees and save a lot of unnecessary polishing.

Next, cut the 16 pavilion girdle facets to a false culet and then cut in the mains. If the mains are cut first you have 16 pavilion facets whose meets you must keep an eye on. By reverse order, you eliminate this problem. Pre-polish with 8000 on a Fast Lap and then polish on the Fast Lap too, but using 100,00 or 200,000 grit.

GEMCUTTER: You mentioned earlier that you prefer man-made diamond polish?

ALDEN: That's right. They're more uniform in size and shape so you don't get fragments breaking off as you would with natural diamonds. Natural diamond grit, I feel, is best for industrial uses, not for the precise finishing that prize-winnintg gems require.

I like Crystallite's paste. It just seems to work better for me.

GEMCUTTER: And the finish. What's the maintenance requirement on a Fast Lap?

ALDEN: Good old fashioned Lava soap and water. As a last check turn the motor on and hold a corundum boule or steel roller on the surface until all clicks disappear. Then wash away the debris; you're ready for the next cutting session. **END.**

Reversing The Gear

Nothing is perfect, including index gears. It is possible that the distance between teeth is ever-so-slightly off somewhere on your gear. If after transfer-dopping you also take off the index gear, turn it over and re-attach it, then any offness which the gear produced on the pavilion (assuming you did that first) will be copied on the crown at the same circumference location on your stone. This makes for more perfect line-up of facets and girdle lines between the crown and pavilion. If the back side of your gear is blank and you have to paint in the numbers, keep them going in the same direction. This will, on a 96 gear, make 90 and 6, or 12 and 84, across from each other. All number pairs across from each other should add up to the gear number. (from John Alden's Secret Arsenal)

Note: in the pictures at the beginning of the article about John Alden, in the left one the long white tube he is looking through is his comparator. In the right picture is his souped-up machine as of 1988. Today it has three micrometer guages, the latest one gives a readout of his cheater. He has made measurements of the sway of his mast toward or away from the lap, even after attaching a second mast which acts as a flying buttress to the main mast. FVS.

COMING ATTRACTIONS 1992

• Australian Faceters Guild Annual Faceting Seminar, **Sept. 19—20**, Warwick, Australia.

• New Zealand Natl. Gem and Mineral Show, **Sept. 25—27**. Write to Jack Houghton, P.O. Box 12—036, Christchurch, New Zealand.

• Reno Gem & Mineral Society Show Convention Center, Reno, Nevada **Sept. 26 & 27.**

• Faceters Guild of Southern Calif. Faceter's Gem Fair, **Sept. 26 & 27**, at the Orange County Fairgrounds, 88 Fair Drive, Costa Mesa, California.

• Intermountain Faceters Guild Show Burley, Idaho, **October 30, 31 and November 1.**

• International Faceters Fair and Workshop, **November 7 & 8**, Sacramento, California, at the State Fairgrounds.

COMING ATTRACTIONS 1993

• The Australian Faceters Guild 1993 Gemboree will be at Alice Springs. Write to AFG Secretary, P.O. Box 2965, Alice Springs, NT, 0871 Australia

• The Calgary Faceters Guild will host the 1993 Northwest Federation "International" Faceters Symposium, in Calgary, Alberta, Canada, **May 22-23.** For information write Violette Merkeley, 2823 Canmore Road NW, Calgary, Alberta, Canada T2M 3J7 Phone: (403) 289-4175

Answer to Puzzles on Page 13.

1) FVS-140. The line between the break facet at index 12 and the culet facet at index 12 must run parallel to the girdle line at index 12. This graphic was made when the culet at index 12 was at index 10, then when I changed the index I forgot to change the graphic. Wait Carss caught this one.

2) Ed-Da-How. The alternating culet facets J and L cannot be as shown. To be as shown, L must be a higher angle than J, not lower.

3) 21 Skidoo. Facet "O" at index 16 and facet "S" at index 16 are both at 44°, so they cannot be separate facets. There should be no line between them.

YOU AR IMPORTANT

Once upon a tim th r was an old typ writ r which work d quit w ll xc pt for on k y. Th r w r forty-six k ys that function d w ll nough, but that on k y not working did mak a diff r nc .

Som tim s clubs ar lik that old typ writ r - not all th k y p opl ar working. Som of th m mb rs may say, "W ll, I am only on p rson. I won't mak or br ak th club." But it do s mak a diff r nc , b caus to b ff ctiv v ry club n ds th activ participation of ach m mb r. Wh n v r you think your fforts ar not n d d, think about that old typ writ r and say to yours lf, "I am n d d v ry much!"

V RYON IS IMPORTANT!

-from Bulletin Editor's Breakfast, Ventura, June, 1990

The chances of seeing someone who knows you are dramatically increased by not wanting to be seen.

It is impossible to make anything foolproof because fools are so ingenuous.

The Story of Meetpoint Faceting by Bud Rogers

(letters and notes furnished by Robert H. Long)

In writing my book "Chronicles of a Faceting Man", I wanted to include the story of how Meetpoint Faceting came about. My original intention when I wrote to Bob Long was to integrate any information which he might send me with what I had already written and sent to him as a guide. But the enthralling story of what took place and the subsequent involvement of Tom Ricks needs to be told separately. Rather than paraphrase certain articles published by Bob Long and the letters from Tom Ricks, extensive quotations will be used wherever possible. I begin with the letter to me from Bob Long, dated November 11, 1988.

"The best way for me to answer your questions about the origin of CAM and Meetpoint faceting is to provide you with copies of some of the published articles, and also the early correspondence between Tom Ricks and me. MHA (Micrometer Height Adjustment) was totally my idea. Norm Steele and the Seattle Faceting Club provided a forum for presenting my ideas on faceting the non-round shapes. Norm provided much encouragement. He also renamed what I called RT (Radius to Tangent) to CED. MHA evolved to CAM in early 1976. My notes for a slideshow presentation show that the transition from MHA to CAM came about as an offshoot of the concept of cutting a SRB by cutting the Break Facets to a common centerpoint as the first step in cutting the pavilion. The notes also show that the acronym CAM was coined by Norm Steele. My article in the July 1976 issue of THE FACETER'S GEM resulted in a letter from Tom Ricks (with a questionable date of 21 June 1976). This was the beginning of a long interchange of information. Tom had the original theory that it should be possible to generate the outline directly as part of the faceting process. Between the two of us, we worked out the process. The important thing to point out is that the whole evolutionary process came about as the result of the free interchange of information. It did not and could not have happened without it..."

Heretofor the standard method for obtaining the girdle outlilne of a marquise or oval was by using an offset head attachment or cams available on some faceting machines. Both methods had drawbacks. Cams lacked flexibility and the offset head attachment did not produce a true ellipse or oval. Nor did either allow for a faceted girdle. So the objective of preforming by the MHA method was to generate a girdle whose outline was a true ellipse. The procedure was published in THE FACETER'S GEM for March, 1976. Although this article represented the culmination of perhaps a year or more of research and development, other developments along the same line were moving equally fast, so much so that by the time of actual publication in March the MHA method had been relegated to its proper perspective of having been merely a preliminary first step. An article by Bob Long, called PREFORMING BY THE CENTERPOINT ANGLE METHOD, was actually presented in SEATTLE FACETOR DESIGN for February, 1976. I quote:

"A previous article in this series gave details for preforming [the] true ellipse (oval) by the Micrometer Height (MHA) method. This article deals with an alternative method for generating the same preform by what I call the Centerpoint Angle Method (CAM). Use of MHA was limited to those persons whose faceting machine incorporated an accurate micrometer height adjustment device. The 'Angle' method does not require a calibrated height adjustment. All that is needed is a reasonably accurate angle indicating device and a stop, both items which are normally found on faceting machines. Also, no calculations are necessary when using the 'Angle' method when different sized stones are cut. In fact, a given set of angles can be used for any size stone with the same proportions..."

The original article by Bob Long, edited and now called "Preforming by the Angle Method", was published in THE FACETER'S GEM for July, 1976. Again

I quote:

"One of the keys to successfully faceting any of the elongated or non-round shapes, such as the oval or marquise, is starting out with an accurate preform, properly aligned to the indexing mechanism of the faceting machine. A technique, which I call 'Angle Preforming' provides such a preform. All that is required to use the technique is a reasonably accurate angle stop. No calculations of any kind are required. The necessary angles have been computed for any size stone with the same proportions. Also, no calibration of the height adjustment is required.

The use of angle preforming does have some limitations, or constraints. Generally, these constraints do not pose any problem. They are:

1. The resulting preform has a pointed pavilion.
2. The pavilion should be cut first.
3. There must be adequate depth of material.

Preforming by the angle method is accomplished by cutting narrow facets to specified angles at all, or selected, index settings and using a height adjustment which will make each of the narrow facets meet at a common point. After completing the cuts necessary to generate the point, a girdle line is marked on the stone at a fixed distance from the point. This girdle line will outline the desired preform shape. The preform is completed by setting the angle to 90° and cutting down to the marked girdle line at each selected index setting. The finished preform has the outline shaped by short, straight-line segments at the girdle, and has a pointed culet which is slightly deeper than the finished stone will be."

Bob Long then followed this explanation with a detailed procedure for preforming a marquise having a 2:1 LW ratio. Tom Ricks had previously subscribed to THE FACETER'S GEM, and upon reading the article immediately responded to Bob Long:

"Your article, Preforming by the Angle Method, in the July 1976 issue of THE FACETER'S GEM has opened a new approach in my search for a method of accurately preforming the non-round shapes with faceted girdles. Thank you for your offer to share your other designs and design techniques. I would very much appreciate this data."

Thus began a long interchange of information, as Bob Long stated in his letter to me. It was another month before Tom Ricks again wrote to Bob Long. You can only surmise that he must have been attempting to cut a stone from the data sent. And, in truth, this is exactly what he wrote to Bob Long in his letter, dated 22 August 1976:

"I have tried the micrometer height adjustment method, using an ULTRA-TEC, and to me it was outstandingly successful. I have not found time to facet with the CAM but from studying the data you sent, I think CAM will be a more direct approach. I intend to try starting with the proper (for the material) break facet angles to establish the preform on the coarse lap, then the mains, undercutting slightly to allow necessary corrections with the pre-polish lap. This will, of course, bypass the step of initially establishing the center point and so may not work, but I infer from your letter that it should..."

There was a gap of a few months before the next letter of 24 January 1977. Sometime previously, after thirty years in the Air Force, Tom had retired and had become involved in a lapidary shop, called GEM-CRAFTERS, in Greensboro, N.C. After the Christmas rush was over, he could, as he said, do some faceting for himself. By now he was wondering if it might be possible to go directly to the faceting rather than making the preform first.

A standard pattern had developed in which Tom Ricks would experiment, keep precise notes, make a draft of what had been done, then send the data to Bob Long for comments and critique. In his letter of 10 February 1977, Tom introduced for the first time an additional concept. As he wrote to Bob Long:

"Your thoughts of a presentation on 'Variations on the CAM Preforming' conjures up all kinds of possibilities. I would like to develop or see someone develop non-preform techniques for faceting ovals and marquises with the culet as a line as well as non-preform procedures for hearts and

pendeloques."

Again in that same letter Tom Ricks, in commenting on a copy of an oval procedure he was sending to Bob Long, stated:

"...what I had hoped to do was to establish a specific 'meet' point or points for each facet. It seems to me that faceting procedures (designs) can be constructed so that each facet can be placed at a predetermined index and angle, and cut to a point where it meets its adjacent facet at a predetermined point...I will certainly appreciate your comments and advice."

We see here the beginning of the "meets" approach to faceting. In his letter of 21 February 1977 Tom notes he is test cutting hearts and pendeloques. There will be more testing and refining yet to come. Meanwhile, as Bob Long states in his letter to me:

"One other important early milestone was the development of the equation for the line of intersection between two facets."

It seems that he and Norm Steele were traveling in Norm's motor home to a conference. Norm handed Bob a paper with some sketches on it which presented a graphic method of changing the 3D calculations to a 2D calculation. As Bob said:

"Those sketches turned out to be the key to the algebraic solution to facet designing. So Norm gets the credit for unleashing the scientific calculators and then the computers onto the job of calculating exact faceting angles."

Not unusual when one is involved in a project, time seems to fly so swiftly. That is exactly what Tom Ricks said in his letter of 19 September 1977. Bob Long had sent him an oval design and Tom replied he would make a Meetpoint sequence on it. He still continued to have problems with a line culet, however. As he said in the letter:

"...I'm now trying, without much success so far, to develop a Meet point sequence for ovals with the culet as a line and as a boat hull shape. No matter how many times I draw and redraw, calculate and recalculate, cut and recut, I still can't make a girdle stay level and maintain the L/W ratio I want. Any words of wisdom ?"

In late October Tom received back his latest design procedure from Bob Long. This time he finally felt that he now knew where he had been going wrong. Or, as he said:

"...and, until you marked up my layout, I came up with the same misunderstanding of CED every time. Now back to the drawing board..."

Later, in this letter of 30 October, 1977, Tom Ricks, in commenting about the forthcoming Faceters Fair, made pertiment remarks about faceting design and techniques which, I think, places in proper historical perspective the kind of relationship which had developed between him and Bob Long:

"..I thought that this year might see me at Faceters Fair, but as of now I don't think it's possible. Why don't you think about a presentation of meet-point as a 'Variation on the CAM'. Don't consider calling it the Ricks method or anything like that. I don't feel proprietary about it at all. All I did was come up with an idea that extends the utility of your CAM technique. Incidentally, I noticed only today, when re-reading your article in September 1977 FACETS, that Merle Reinikka, in his correction notice on the marquise article, gave me credit for the 10-main marquise design. Sorry about that! The design is yours of course, as are most that I try to adapt the meet-point cutting sequence to..."

The last quotation from his letter of 18 December, 1977, acknowledgement is noted by Tom Ricks that the goal of cutting an oval with a line culet by the Meetpoint method had finally been achieved.

"Your letter with the copy of an article on cutting an oval with a line culet arrived before my copy of FACETS...your procedure looks good. Some time ago, I did some work on a meet-point sequence for a line-culet oval but didn't get anywhere with it. You have now inspired me to go at it again..."

The first of the Supernova oval series was published in SEATTLE FACETOR DESIGN, January, 1978. These were designs by Bob Long which had a point as the culet and were to be cut by Meetpoint sequence. In March the LAZY OVAL design with a line as a culet, again by Bob Long, was published. The LAZY MARQUISE, having a line culet and designed by Bob Long, was published in the FACETER'S GEM in March, 1978. Two marquise designs by Tom Ricks appeared in FACETS, one in June, 1977, and the second in July, 1978. Both had a point as a culet. Pears based on the LAZY theme of having a line as the culet were published in November, 1978.

Besides CAM and Meetpoint, a third method of generating a preform evolved out of CAM, called CLAM, for CORNER LOCATOR ANGLE METHOD. It appears to be a hybrid cross between the other two. Like Meetpoint you have a set of permanent facets, and like CAM you have a set of temporary facets which are recut after the corners and size of the stone have been determined. The first time I saw it was in Vol. 6, the BARION CUTS. It appears to be restricted to the Barion theme where the design has cut corners. It should present no problems. I cut TRIBRITE (SFD, February, 1988) according to the instructions, and it came out just great.

In just two years time, Bob Long and Tom Ricks had come a long way.

A.F.M.S. FACETING RULES UPDATE

After 3+ years of serious study and consolidation of recommendations from faceters of all the Federations, the A.F.M.S. Faceting Rules Committees' proposed changes for subdivision CF: Faceted Gemstones, was accepted with but a few minor changes. This proposal was presented to the A.F.M.S. Rules Committee at the AFMS/MWF Convention and Show, July 1992, in Brunswick Ohio by Bill Horton, the AFMS/FRRC Chairman.

The submitted proposal, changes, etc., were worked on and then voted on by the Committee representatives of all six Federations, based on majority rule. The new Faceted Gemstone Rules, Subdivision 12.0-12.12, and CF-1 through CF-5, pages C-13 1992 through C-15 1992, should be in effect in 1993. A copy of these three pages may soon be obtained from A.F.M.S. through your local Federation. A few of the more major changes are as follows:

1. Three of the original 8 CF Classes were eliminated (old numbers CF-3, CF-6, and CF-7)
2. Stones mounted in jewelry are no longer allowed in any category. (Rule 12.5)
3. No less than 3 stones or more than 6 stones from each exhibit will be removed from the case and judged up close; similar cuts will be selected from each case. (Rule 9.2)
4. Glass stones will be allowed in classes CF-4 and CF-5. (Rule 9.2)

The FRRC request for a separate trophy in the 12 stone classes was voted down (in part by past AFMS trophy winners).

We had several requests from CFMS members and clubs to have 1-stone or 3-stone classes (not requiring the competitor to furnish a case), but this was rejected at the committee level.

It has also been suggested that another exhibitor group should be added to the existing groups of Novice, Advanced, Master and Junior. This would be a group to separate the "World Class Faceters" out of the Master exhibitor group. Then a new competitive class could be created for these "World Class Faceters" specifying number of stones, cuts, etc., for an additional trophy competition. This would make the Master competition more equitable, since the "World Class" Competitors, who are well above this level would compete for the new trophy.

I feel the changes made by the FRRC are a welcome beginning which will encourage more faceters to enter competition. Further changes can be made by following the established AFMS procedures. We should never stop trying to improve the competition rules governing our hobby.

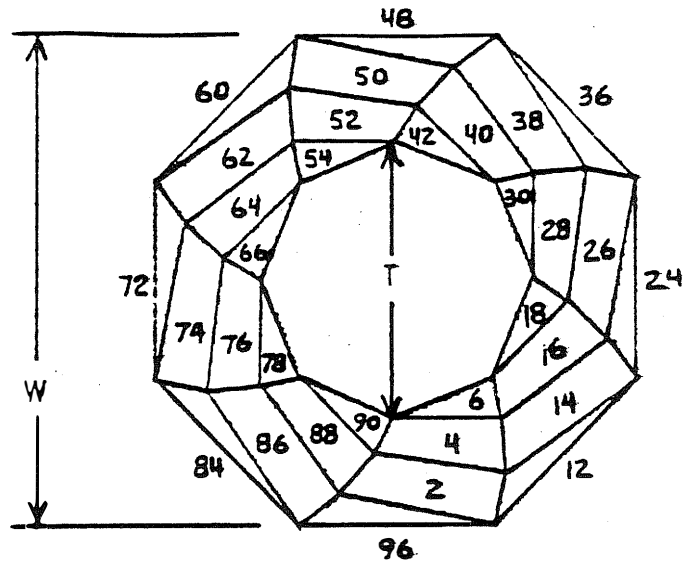
by Bill Norton
CFMS Representative to
AFMS Faceting Rules Revision Committee

Modified Pinwheel Cut

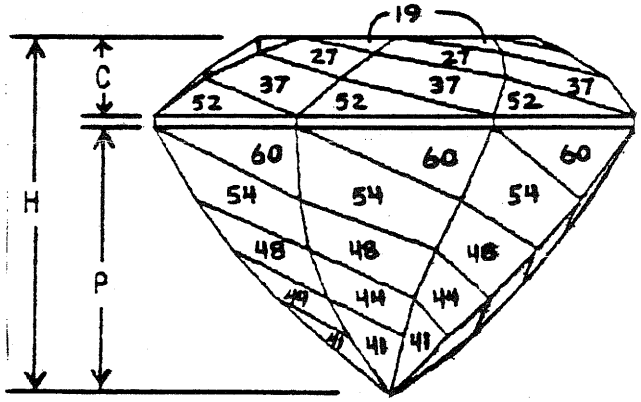
96 Gear Angles for Corundum
Crown:

1.	8	at	52.00°	96,12,24,36,48,60,72,84.
2.	8	at	37.00°	2,14,26,38,50,62,74,86.
3.	8	at	27.00°	4,16,28,40,52,64,76,88.
4.	8	at	19.12°	6,18,30,42,54,66,78,90.

Shape = Octagon.
Table Area = 27.8 %
T/W = .5714
C/W = .1604
P/W = .5642
H/W = .7446



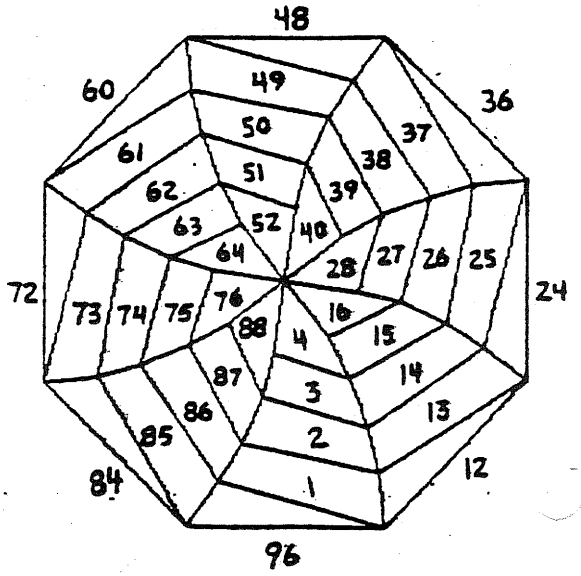
Note: The original cut can be found in the MDR Book of Gem Cuts, Vol. 3. The pavilion facets there are two teeth apart and the pav. angles range from a high of 53° to the culet facets at 28°, obviously a fisheye stone. The modifications here have the pavilion facets one tooth apart to produce a normal set of pavilion angles. The table has been made a more normal size.



Pavilion:

1.	8	at	60.00°	96,12,24,36,48,60,72,84.
2	8	at	54.00°	1,13,25,37,49,61,73,85.
3.	8	at	48.00°	2,14,26,38,50,62,74,86.
4.	8	at	44.00°	3,15,27,39,51,63,75,87.
5.	8	at	41.00°	4,16,28,40,52,64,76,88.

Designed by Ed Hume
Computed by Fred W. Van Sant

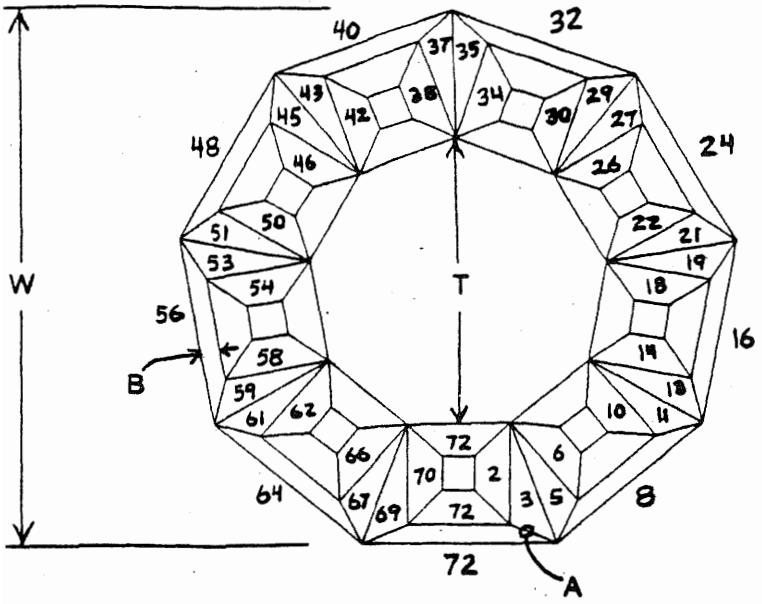


Windows Cut
72 Index Gear
Angles for Corundum

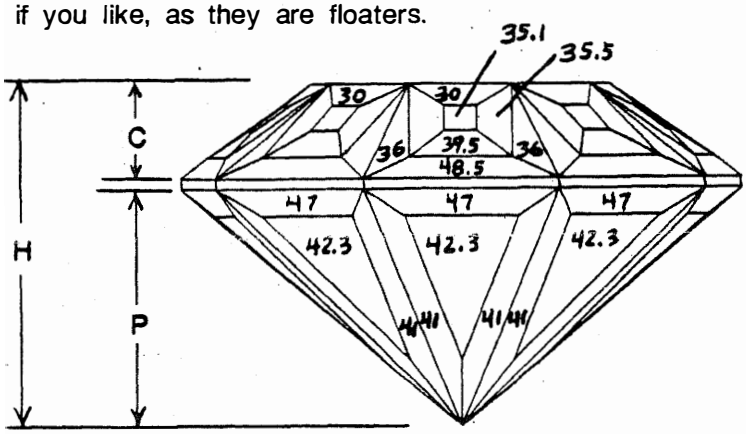
Crown:		Angle	Indexes
1.	9	at 48.48°	72,8,16,24, 32,40,48,56,64.
2.	18	at 36.00°	3,5,11,13,19, 21,27,29,35, 37,43,45,51, 53,59,61,67,69.
3.	9	at 39.54°	72,8,16,24, 32,40,48,56,64.
4.	18	at 35.47°	70,2,6,10,14, 18,22,26,30, 34,38,42,46, 50,54,58,62,66.
5.	9	at 30.03°	72,8,16,24, 32,40,48,56,64.
6.	9	at 35.06°	72,8,16,24, 32,40,48,56,64.

Shape = 9-sided 'Round'
Table Area = 28.6 %
T/W = 5357
C/W = .1732
P/W = .4413
H/W = .6345
A/W = .09824
B/W = .05431
D/W = . 0722
E/W = .1008

Cutting Angles in Degrees →



For this crown, only a 9-sided shape will allow the little windows to be square and also have a normal size table. The 'windows', set 6, can be made larger if you like, as they are floaters.

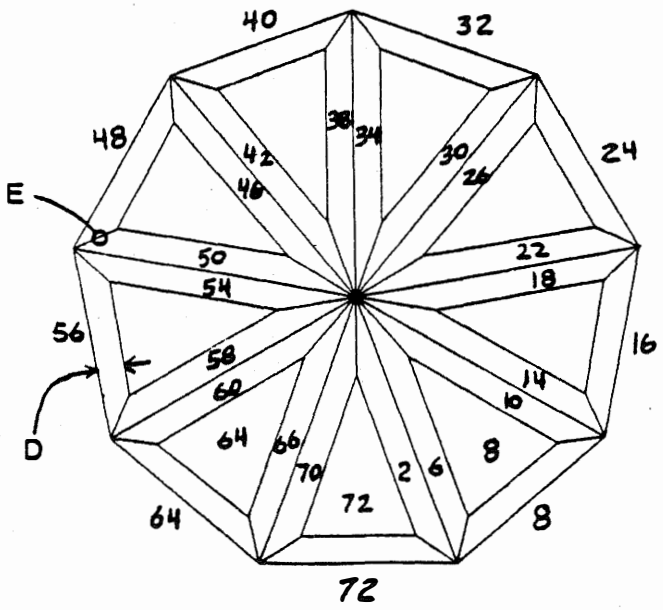


Maximin Cone Angle for CAM = 38.8°

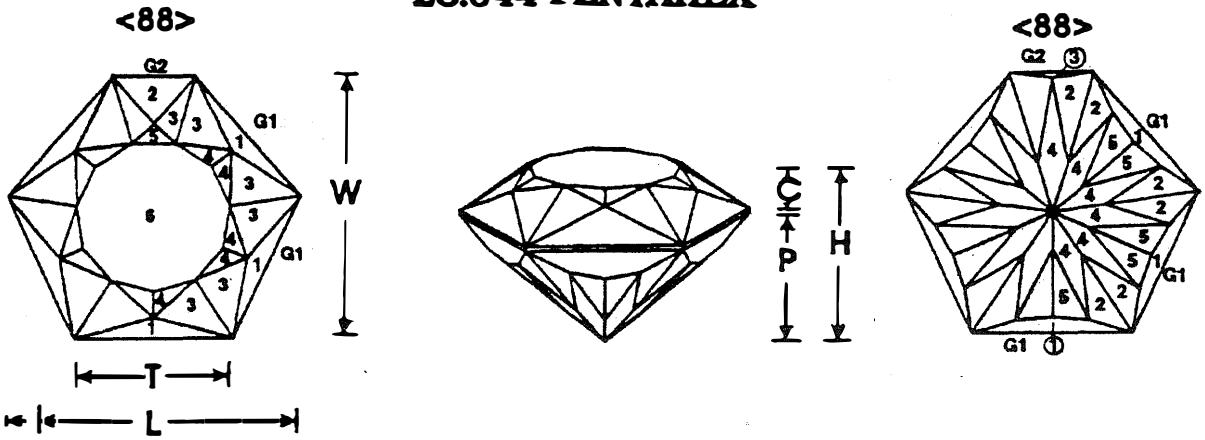
CAM Preform:
Cut 9 facets at 40. 57°
Indexes 72,8,16,24,
32,40,48,56,64.

Pavilion:		Angle	Indexes
1.	9	at 46.98°	72,8,16,24, 32,40,48,56,64.
2.	18	at 41.00°	2,6,10,14,18, 22,26,30,34, 38,42,46,50, 54,58,62,66,70.
3.	9	at 42.33°	same as set 1.

Designed by Fred W. Van Sant



26.044 PENTAHEX



New Design: by Robert H Long

88 Index L/W=1.099 P/W=0.484 C/W=0.183 T/W=0.576 H/W=0.687
69+6 Facets Vol/W^3=0.262 Angles for RI=1.54 (Quartz)

PAVILION CUTTING INSTRUCTIONS

Step/Angle		Bearing Index	Comment
G1	90.0	12-28-44-60-76	Cut ECED
P1	65.0	12-28-44-60-76	Cut ECED / form level lower girdle line
P2	42.0	2- 6-18-22-34-38 50-54-66-70-82-86	Meet P1-G1 at corners / form TCP
G2	90.0	88	Meet P1-P2-G1
P3	62.0	88	Complete and level girdle.
P4	41.0	88- 8-16-24-32-40 48-56-64-72-80	Main facets / First cut index 88 facet to meet P2-P3-P2 then the others in the P4 tier at constant mast height (they meet at the centerpoint).
P5	42.0	10-14-26-30-42-46 58-62-74-78	Meet P1-P2-P4

CROWN CUTTING INSTRUCTIONS

Step/Angle		Bearing Index	Comment
C1	60.0	12-28-44-60-76	Match pavilion facets to give level upper girdle line.
C2	38.0	88	Level girdle
C3	35.0	2-6-18-22-34-38 50-54-66-70-82-86	Main facets / Meet G1-C1 at corners
C4	26.0	8-16-24-32-40 48-56-64-72-80	Star facets / Meet C1-C2-C2-C1
C5	30.4	88	Meet C3-C2-C3
C6	0.0	Any	Table facet /Meet C3-C4-C4-C3

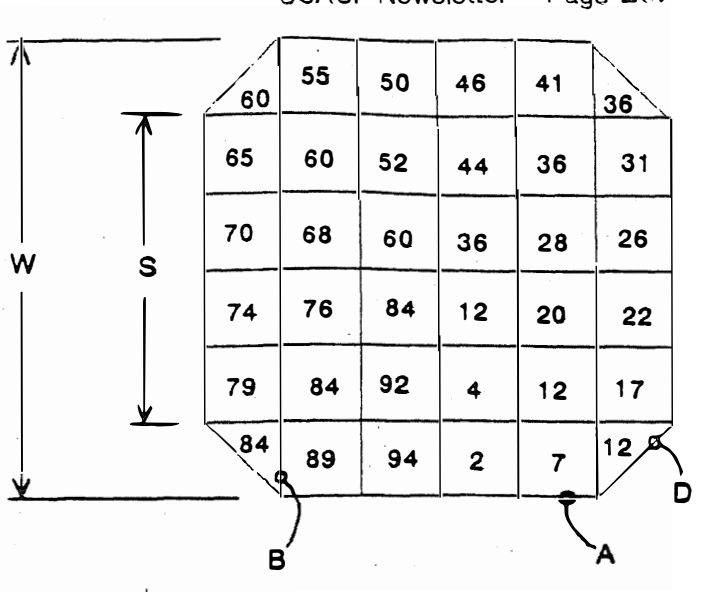
$Vol = W^3 \times .262$ (FVS)

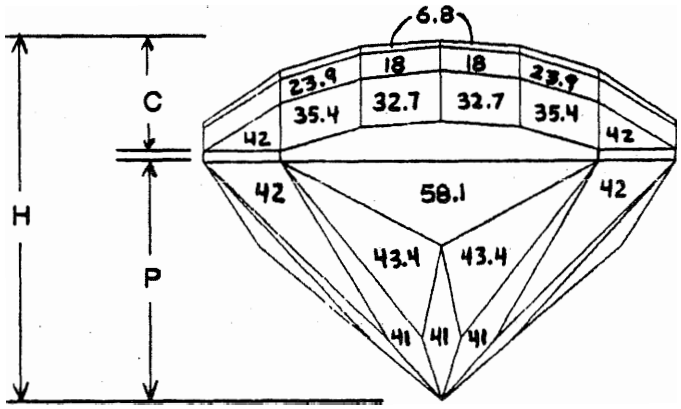
Squaround Checker
Gear = 96 Angles for Corundum

Crown:		Angle	Indexes
1.	8 at	32.71°	2,22,26,46, 50,70,74,94.
2.	8 at	35.37°	7,17,31,41, 55,65,79,89.
3.	4 at	42.00°	12,36,60,84.
4.	8 at	17.98°	4,20,28,44, 52,68,76,92.
5.	4 at	23.94°	12,36,60,84.
6.	4 at	6.77°	12,36,60,84.

C/W = .1723
P/W = .5213
H/W = .7136
S/W = .6667 (2/3)
A/W = .17469
B/W = .19758
D/W = .2357

Made to the Squaround Shape. Crown and Pavilion are interchangeable with other Squarounds of FVS.



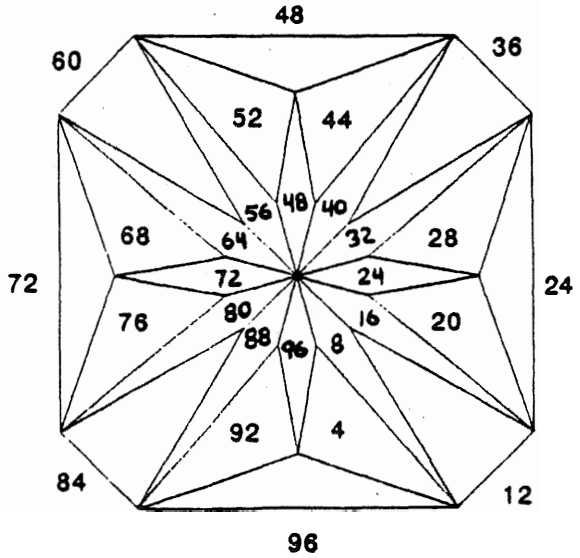


Maximum Cone Angle = 35.8°
CAM Preform:

1.	4 at	41.00°	96,24,48,72.
2.	4 at	36.41°	12,36,60,84.

Pavilion		Angle	Indexes
1.	4 at	58.09°	96,24,48,72.
2.	4 at	42.00°	12,36,60,84.
3.	8 at	43.38°	4,20,28,44, 52,68,76,92.
4.	4 at	41.00°	96,24,48,72.
5.	8 at	41.00°	8,16,32,40, 56,64,80,88.

Designed by Fred W. Van Sant



Dear

We welcome you to the USACF. You will receive all issues of our newsletter for the year in which you join, plus copies of our Constitution and Single-Stone Rules. While some of the competitions may have come and gone, you will get an idea of what kinds are being run in various parts of the country and the designs used. We also try to print informative articles on various aspects of faceting and a new design or two.

Your $25 yearly membership dues support the USACF in its effort to improve faceting competitions and uniform judging rules and practice both in the U.S. and internationally. Part of your dues go to build a fund for holding an international competition here in the U.S. We support the U.S. team members and other entrants in the Australian Cup Challenge, held every two years, through soliciting contributions from commercial companies. The recent top 12 entrants in the 1992 Cup Challenge each received a lap from Crystalite Corp. Some also received faceting rough. We are also sponsoring the creation of a Faceting Dictionary and expect to shortly begin negotiating a set of International Rules for Single-Stone Competitions.

We do not offer a Subscription only Membership.

Prospective New Member: Please fill out the form below. Make $25.00 check or money order payable to Lillian Hettich.
Send to Lillian Hettich, at 31 Sea Breeze Drive, Half Moon Bay, CA. 94019

---------- ***Cut Here*** ----------

MEMBERSHIP APPLICATION TO USACF

Name _____ Phone No. _____

Mailing Address _____

Street Address _____

City _____ State _____ Zip _____

Interested in judging ?	Yes ____	No ____
Do Commercial Cutting ?	Yes ____	No ____
Have a display case ?	Yes ____	No ____
Need help with machine ?	Yes ____	No ____
Give help on machine ?	Yes ____	No ____

Approx. how many stones have you cut ? _____

Machine
_____
_____

Check One	
Beginner	____
Average	____
Advanced	____